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Galileo gets close look at frozen Europa

PASADENA, Calif. - The Galileo spacecraft swooped within 124 miles of Jupiter's frozen moon Europa, its blistered surface strengthening suspicions that a briny ocean harboring life could lie beneath an icy crust.

The near-pass Tuesday was Galileo's closest look at Europa, which has become a major target for exploration because it likely has two elements needed to support life: water and heat.

"Europa really is the gem of the solar system," Ronald Greeley, an Arizona State University geologist, said at a briefing by mission officials at NASA's Jet Propulsion Laboratory.

View of ice-encrusted surface of Europa taken by Galileo spacecraft in September (NASA).

Scientists will have to wait a few weeks to get the latest pictures snapped by Galileo, but instruments recently detected signs of magnesium salts that bolstered the belief that an ocean could be under Europa's cracked-ice surface.

Images from the last Europa pass, on Nov. 6, provide new signs that slushy material is pushing upward, rupturing the surface and freezing in formations that scientists likened to blisters.

Greeley pulled out a lava lamp to demonstrate the principle: As the whitish material is heated by the lamp, it rises inside the blue liquid.

"This is what we think could be happening to these blisters," he said.

The smallest of Jupiter's four major moons, Europa is believed to have both water and internal heat from the friction of tidal forces and from radioactive sources such as uranium. But whether that heat is sufficient for maintaining a "liquid ocean" remains an open question, said project scientist Torrence Johnson.

The Europa passes are part of a $30 million, two-year extension to Galileo's primary mission of exploring Jupiter and its moons. The

new mission is making return trips to moons of interest such as Europa, Ganymede, Callisto (the most heavily cratered moon in the solar system) and Io (the most volcanic body in the solar system).

Launched in 1989 from a shuttle, Galileo has provided enough new information that scientists are rewriting textbooks.

It found spectacular thunderstorms on Jupiter with thunderbolts up to 100 times stronger than those on Earth. Ganymede surprised scientists with its magnetic field and its magnetosphere, a surrounding region of charged particles, making it the seventh body in the solar system to have one.

At Io, Galileo found not only glowing volcanic gases but also glowing lava hotter than what flows from terrestrial volcanoes.

It also found metallic cores at Io, Europa and Ganymede, but none at Callisto.

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